VARIOUS.

Crystal Finding.

The use of rock crystal in the manufacture of optical instruments has led to the development of the curious and interesting profession of crystal finding. It is, however, an old occupation in the Swiss Alps, where not only the knowledge of the crystal finder, but his nerve and endurance, are often put to a severe test. The rock crystal — pure silica, or crystallised quartz — is found in pieces of different size, colour, and fineness, sometimes separately, sometimes in groups. The strahler — as the crystal finder is called — is equipped with a bar of iron 4 feet long, bent up at one end, a shovel, a hammer, a hack, a strong cord, and a leather sack, and starts for his work early in the morning. He is nearly always alone, as the Swiss are not fond of "going shares" in any piece of good fortune. He crawls along the flanks of the hills hours together, along the most perilous paths, looking out anxiously for any indication of a vein. This may be a long way above him, and he tries to reach it as best he can, being not infrequently compelled to cut his steps in the rock. His first act, on reaching his find, is to strike it with his hammer, his ear telling him whether the crystals are attached to the walls, separate, or mixed with sand. The most celebrated find of large crystals is the recent one made at St. Gothard. A hundred feet above the snow limit, an apothecary, a resident of Berne, saw, one evening, a vein of quartz 60 feet long and 4 to 12 feet thick. A guide was with him, and the two resolved to ascend for an investigation. This, however, had to be deferred till the morning. The would-be finders passed the night in a hut, and rose early to make the ascent. Unfortunately, the morning was misty, and threatened to cut off their retreat. They descended in haste, and were unable to renew their attempt until the following year, when the spring had melted the winter snows. The day at length arrived when they were able to begin work, and by mining the vein they pierced into its inner chambers, and collected 300 cwt. of crystals, the largest of which were bought up by scientific institutions, and the fragments by opticians and instrument makers. *Iron.*

Uses of Infusorial Earth.

For the preparation of cements and of artificial stone a number of processes have been devised, in which infusorial earth plays a prominent part, viz.: — Equal parts of infusorial silica and litharge, and one-half part of slaked lime, stirred to a paste in linseed oil; is affirmed to become as hard as sandstone on setting, and is recommended as an excellent compound for cementing stone, metal and wood. The following recipe, again, is pronounced to be serviceable for the production of an artificial stone for art objects. For this purpose infusorial earth is intimately mixed with well pulverised, freshly burned lime, in the proportion of from three to six parts of the former to one of the latter. The mixture is then pressed into moulds under an addition of a very slight quantity of water. The resulting product, a silicate of lime, is formed with the evolution of considerable heat. The objects produced ultimately attain great hardness; they are perfectly waterproof, and may readily be coloured with any colour used in stereochromy. In combination with sulphur, infusorial earth forms a plastic mass, called zeiodelite; but no uses have yet been made of it. In combination with magnesite (carbonate of magnesia), infusorial earth forms what is described as an excellent cement, which is manufactured in Germany, and sold under the name of "albolite". In pottery, the infusorial earth has received several important applications. When fused, for example, with borate of lime, as such is obtainable in the trade under the name of boronatrocalcite or tincalcite, an excellent glazing is produced, which is not only useful for furnaces and pottery of all kinds but also for enamelling iron and slate, being free from lead and not apt to crack off. By fusing a mixture of infusorial earth (freed from sand) with borate of magnesia (stassfurtite), a kind of "hot-cast porcelain" is produced, having great durability and beauty. For this purpose the infusorial earth requires to be perfectly dry and free from lumps. It is introduced into the crucible in small portions and under constant stirring, until the fused stassfurtite ceases to take up more. The mass may be cast like glass, and if very liquid it may even be blown, and is thus fitted for an extensive application. Boettger publishes the observation that when an alcoholic solution of any of the coal-tar colours is mixed with a sufficient quantity of infusorial earth, water added, and the mixture filtered, the liquid will run off clear, while the earth retains all the pigment. Hitherto the compounds of alumina have been used for the production of the so-called lakes, and it is quite probable that the above-noted behaviour of this material may find important applications in the arts. The use of infusorial earth has been suggested in glass making as a substitute for sand; but it appears not to be well suited for this purpose, the reason assigned being that it swells too much in the crucible. In the manufacture of soluble glass (water-glass), for which it has likewise been tried, the impurities it contains — clay, phosphate of lime, &c. — have been found to render it somewhat unsuitable. A compound called diatite, devised by Merrick, consists of gum-lac and infusorial earth. The silicious earth has been added to sealing-wax to prevent its running; it is sometimes added to paper to give it body; and to soap for the same purpose, and to add to its detergent qualities (?); and it is said to form an excellent addition to rubber, for certain uses of the latter; its addition to modelling clay is said to prevent it from cracking in moulding; and lastly, though doubtless many real or suggested applications of this curious substance have been overlooked, it is said to be of use in the manufacture of smalt and ultramarine. *Iron.*

Sideraphthite, a new Iron Amalgam.

This is composed of 65 parts iron, 23 nickel, 4 tungsten, 5 aluminium, 5 copper. It resists sulphuretted hydrogen, is not attacked by vegetable acids, and only slightly by mineral acids. It is really more useful than standard silver, while it can be produced at a cost not exceeding that of German silver. For alloys which have to be silverplated to prevent oxidation, the inoxidisable iron, as the above is called, is stated to be a perfectly successful substitute.

New Railway Carriage.

The Compagnie française de matériel de chemins de fer, at Ivry, is now building a special type of carriage for service on the little railway between Bayonne and Biarritz. The designer is M. Carimantraud. The framework is entirely in iron; in spite of their large size the weight of the carriages is relatively small; the panels of the body are made of thin slips of wood, covered on both sides with varnished canvas. There is a covered upper story, and an interior staircase; each carriage is arranged for three classes, and has a goods department and smoking platform as well. The open spaces are as large as possible, to permit good views being taken. Petroleum is used for lighting; the lamps are so arranged as to give light to the interior and at the same time show the signals. Each carriage, all full, accommodates ninety-two passengers.
